6th November, 1962.

Dr. J.B.S. Haldane, F.R.S.,
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Bhubaneswar-3,
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Dear Haldane,

Thank you so much for your congratulations on the Nobel Prize. I can answer one of your points. The DNA chains in the double helix run in opposite directions, so there is no problem chemically about joining up an inversion. However, as you point out, an inversion made at random will usually inactivate two genes (one at each end) and this may by why they have not been found in phage and in E. Coli.

In higher organisms one possible explanation is that the DNA is not one very long chain per chromosome, but a series of discrete DNA molecules joined by non-DNA (protein?) links. It may be that inversions only occur at these links. If so, a study of inversions might show where the links are. I can't say I like this, but then we know so little about the structure of chromosomes.

The nest-building by wasps sounds rather fun. It is not unlike a problem which is still in front of us - the order of assembly of subunits on the (icosohedral) surface of a small virus. I am really quite surprise at Davis' results and would like to hear more about them.

Yours sincerely,

F. H. C. Crick